United States Patent

[11] **3,568,798**

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[54] **LADDER STABILIZER**
6 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **182/172**
[51] **Int. Cl.** **E06c 1/22**
[50] **Field of Search** 182/172, 169, 107; 248/188.6, 210

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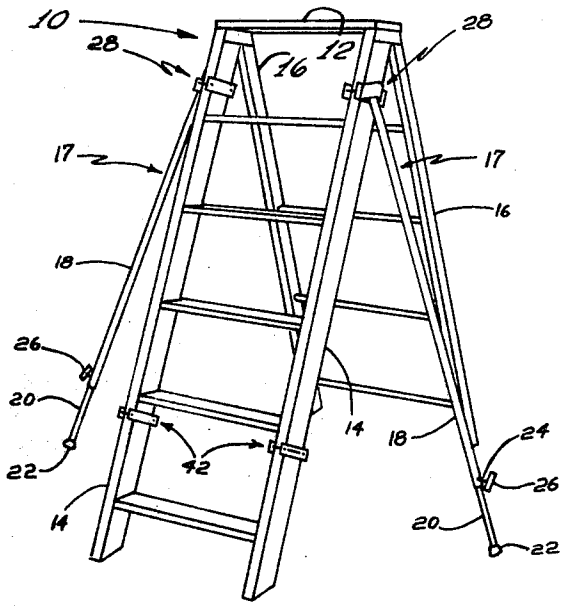
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ABSTRACT: A ladder stabilizing apparatus which consists of foldable, extensible legs mountable on the siderails of a ladder by means of a hinging structure which dictates and limits the angular displacement of the legs.



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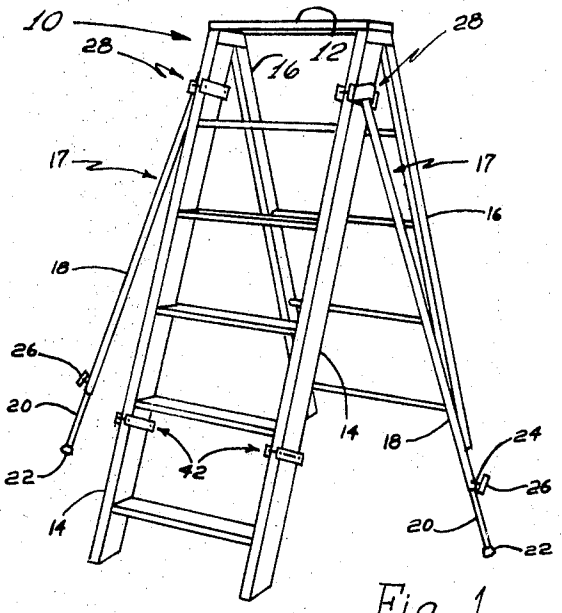


Fig. 1

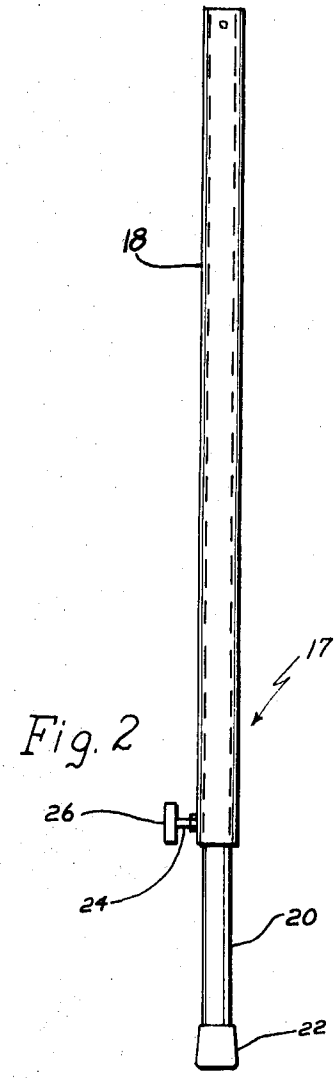


Fig. 2

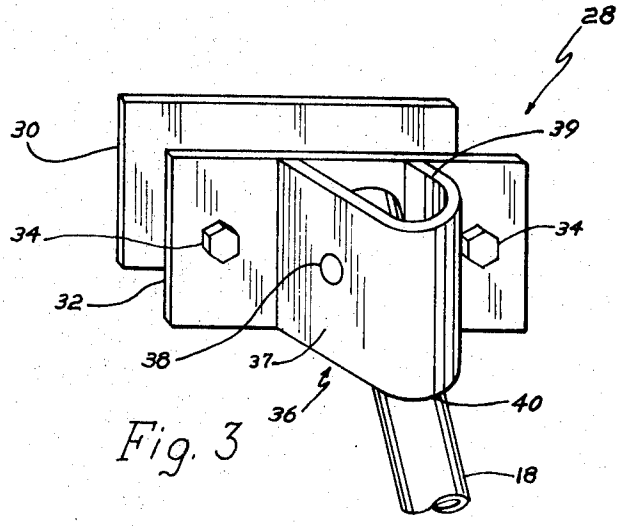


Fig. 3

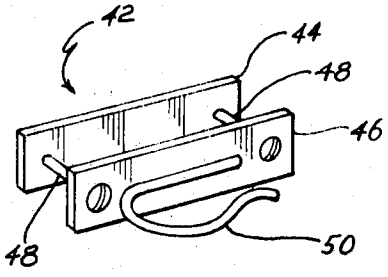


Fig. 4

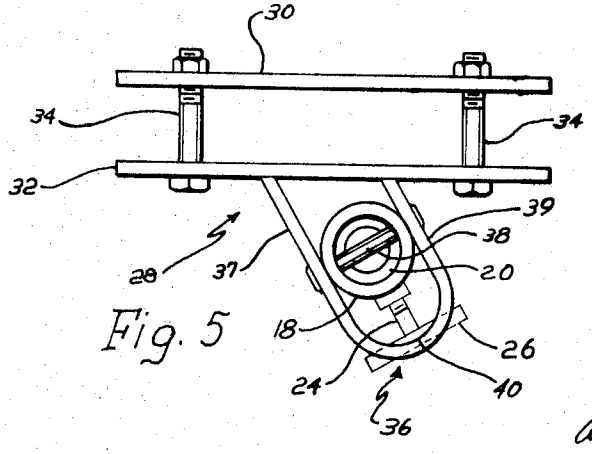


Fig. 5

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LADDER STABILIZER

When an ordinary stepladder is erected into its useful position by unfolding the step section from the brace section, it is relatively stable with respect to forces operating from the front, back or top; however, with respect to moments produced about horizontal axes running from front to back or lateral forces imposed on the structure, the ladder is quite unstable and susceptible to overturning. These stability conditions require the user to exercise utmost care in the positioning of his body or tools on the ladder or risk what could be a serious fall.

One solution to this problem of lateral instability is to provide the ladder with an additional set of legs extending from the sides outwardly and downwardly to engage the surface which supports the ladder. One of the most important advantages of a stepladder however, is that it can be folded into a reasonably compact unit for carrying and storage; therefore, unless the additional legs are also easily foldable into a compact unit with the stepladder, the basic advantage of the stepladder is lost. Various devices employing the above solution are known in the prior art but their use in conjunction with the ladder has produced an assembly which was cumbersome, unwieldly, time-consuming, and somewhat ineffective primarily because of the unsuitability of the devices to be folded into a neat, compact relationship with the ladder.

Briefly, the present invention consists of a pair of extensibly adjustable legs made up of one tubular member telescoped inside a second tubular member and the two members releasably fastened together by means of a setscrew in any adjusted position. The legs so formed are mounted in a hinge structure which is adapted upon attachment to the siderails near the top thereof to allow the stabilizing legs to be unfolded from a parallel position against the siderails into an outboard position with the stabilizing leg tips contacting the supporting surface intermediate the points of contact of the siderails and the brace legs so as to cooperate therewith to define a pair of side-by-side tripods or a "hexapod" stand. The hinge structure is also designed to serve as a stop limiting the angle through which the stabilizing legs may travel into extended position. A spring clip is provided on the lower end of the siderails to retain the stabilizing legs in the folded position.

It is therefore the principal object of the present invention to provide additional stabilizing legs for a ladder which are mountable on the ladder in such a manner as to be easily foldable against the ladder resulting in a neat, compact unit.

A second object of the invention herein disclosed is to provide stabilizing legs for a ladder which can be easily extended or retracted to adjust for uneven supporting surfaces.

Another objective is the provision of a mounting hinge for ladders and the like which will guide and limit the angular displacement of the stabilizing legs.

A further object is to provide a novel and improved ladder stabilizer which is rugged, lightweight, inexpensive, does not interfere with normal use of the ladder, and is capable of being mounted on existing ladders.

Further objects and a better understanding of the invention will become more apparent from the following description, taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a perspective view of the stabilizing apparatus shown attached to and used in conjunction with an ordinary stepladder;

FIG. 2 is a side view of one of the stabilizing legs;

FIG. 3 is a perspective view of the mounting hinge structure showing the stabilizing leg hingedly connected therein, portions of the latter having been broken away to conserve space;

FIG. 4 is a perspective view of the spring clip for the leg and the mounting bracket therefor; and

FIG. 5 is a top view of the mounting hinge structure showing the stabilizing leg hinged therein.

Referring initially to FIGS. 1 and 2 of the drawings, reference numeral 10 refers generally to the ladder stabilizing apparatus of the present invention shown mounted on an ordinary stepladder 12 having siderails 14 and brace legs 16. The

aforesaid apparatus consists of two adjustably extendable stabilizing legs 17 each of which includes a first tubular member 18 and a second member 20 telescoped inside the latter. A nonskid tip 22 is shown provided on the end of the second member for more positively gripping the supporting surface. The telescopic connection between the two leg-forming members is maintained in adjusted position by setscrew 24 which includes a handle 26 that facilitates locking the extendable legs.

Next with reference to FIGS. 3 and 5 it will be seen that the legs are pivotally attached within the mounting hinge structure, generally referred to by numeral 28. The mounting hinge structure includes a pair of plates 30 and 32 held together by removable fastening means 34 of sufficient length to allow the siderail of a ladder to be passed between the plates. The outside plate 32 mounts the hinge bearing bracket 36 at an angle which allows the stabilizing legs to be unfolded from a parallel position against the ladder siderails into an operative position wherein the tips of the stabilizing legs contact the supporting surface at a point intermediate the points of contact of the siderails and brace legs. The first member 18 of the stabilizing leg is freely pivoted within the hinge bearing bracket 36 by hinge pin 38.

The hinge bearing bracket 36, generally U-shaped with essentially parallel sides 37 and 39 of unequal lengths connected at their outer ends by rounded web 40, forms a channel when mounted on the ladder siderails which is substantially parallel thereto. Rounded web 40 cooperates with hinge pin 38 to form a stop adapted to limit the angular displacement of the stabilizing legs. As the leg is unfolded, it can swing outwardly until the first leg member 18 comes against the lower inside edge of the rounded web 40 thus forming the stop.

The spring clips 42 for holding the legs against the siderails in folded position are shown in FIGS. 1 and 4 to which reference will now be made. These clips include a bracket having two plates 44 and 46 held together by removable fasteners 48 of sufficient length to allow the siderail of a ladder to be passed between the plates. A U-shaped spring 50 suitable for engaging and securely holding the stabilizing legs 17 is mounted on the face of the outside plate 46 of the mounting bracket.

In the ordinary application the mounting hinge structure is fastened on the siderail near the top of the ladder by placing plate 30 on the inside of the siderail, plate 32 on the outside with the hinge bearing bracket angled toward the back of the ladder, and frictionally clamping the structure to the siderail by tightening fasteners 34. The spring clips 42 are similarly mounted on the siderails near the lower end as shown in FIG. 1 at 42.

By unfolding the stabilizing legs, extending them outwardly, and adjusting the length of said legs to positively engage the supporting surface, the ladder is stabilized against lateral forces or moments. The above description and drawings have described the present invention used in combination with an ordinary stepladder, however, it is clear from the disclosure that the invention can as well be used in combination with other types of ladders including straight ladders.

I claim:

1. A stabilizing apparatus for use with a ladder comprising:
   - a pair of hinge bearing means attachable to the siderails of a ladder, adapted to hinge a pair of stabilizing legs at their upper ends enabling said legs to be unfolded from a position adjacent and substantially parallel the ladder siderails to a position angling outwardly from the siderails, and forming stops to limit the hinging angle of said legs;
   - a pair of stabilizing legs hinged at their upper ends in said hinge bearing means; and
   - restraining means mounted on the ladder and adapted to hold said legs in a folded position adjacent and substantially parallel to the ladder siderails.

2. The stabilizer apparatus as set forth in claim 1 in which; at least one mounting plate is provided to attach to the ladder siderail and carry said hinge bearing means.

3. The stabilizing apparatus as set forth in claim 1 in which; said stabilizer legs are adapted to be hinged at their upper ends and are adjustably, longitudinally extensible.

4. The stabilizing apparatus as set forth in claim 1 in which; said restraining means consists of a pair of horseshoe-shaped spring clips mounted on the outside of the ladder siderails and adapted to frictionally engage said legs as the latter are folded parallel to the ladder siderails.

5. The stabilizing apparatus as set forth in claim 1 in which; said hinge bearing means consists of a U-shaped bracket so mounted that the sides form a channel which is substantially vertical and parallel to the ladder siderails and the curved end is spaced outwardly away from the siderails, and a hinge pin

fixed between said sides perpendicular thereto and adapted to hinge said legs within said channel.

6. The stabilizing apparatus as set forth in claim 5 in which:

said U-shaped bracket sides are of unequal lengths with the shorter side being mounted nearest the rear edge of the ladder siderail thereby causing the longitudinal axis of the hinge pin to intersect the side of the ladder siderail at an acute angle; and

said hinge pin is so positioned in said bracket to cause said curved bracket end to form a stop at the lower edge thereof limiting the hinging angle of said legs.